

2019 Research Showcase

& STIC Annual Meeting

Integration of Unmanned Aircraft Systems (UAS) Into Operations Conducted by New England Departments of Transportation

PROJECT TITLE

NETC 18-3: Integration of Unmanned Aircraft Systems (UAS) Into Operations Conducted by New England Departments of Transportation

STUDY TIMELINE

April 2019 – April 2021

INVESTIGATORS

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Fact sheets can be found for additional projects featured at the 2019 Symposium at <http://vtrans.vermont.gov/planning/research/2019showcase>

Additional information about the VTrans Research Program can be found at <http://vtrans.vermont.gov/planning/research>

Introduction

Safety, accountability, and transparency are key guiding principles of State DOTs in their stewardship responsibilities. These principles are embodied in their mission areas to provide an effective and reliable transportation system. UAS technology is proving to enhance State DOT's practices as an innovative and inexpensive solution that improves safety and accessibility, reduces cost, streamlines processes, improves workforce utilization and accelerates several transportation operations activities. Various transportation operations are challenged with competing demands for efficiency and effectiveness, which bolsters the need to investigate the potential for using UAS as a supplement or replacement to those workflows. A few studies have been conducted at the national level, but little guidance has been published on incremental steps to integrating UAS in various applications. However, many states have committed to creating a formal UAS program and/or are finding opportunities to integrate UAS technology on a case-by-case basis. In fact, 36 out of 50 State DOTs funded centers or programs for UAS operations. The objective of this research is to provide guidance to New England State DOTs regarding effective practices when incorporating UAS into daily operations.



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Figure 1. Photo. Bridge inspection with a UAS.

Methodology

In order to achieve the aforementioned objectives, the research team will:

- Gather and analyze state of the practice data on national and New England State DOT insights through a literature review and targeted interviews. Currently, popular applications of UAS technology in the transportation industry include structural inspections, surveying and mapping, emergency response, monitoring construction progress, and public outreach.

Additional information about the VTrans STIC Program can be found at <http://vtrans.vermont.gov/boards-councils/stic>

- Gather market data on UAS hardware/software components and related support systems. Bringing clarity to market-ready technologies will be a focus of the research team.
- Conduct case studies on optimal combinations of UAS technology and transportation operations applications. It is expected that the case studies will further investigate those applications suitable for augmenting traditional methodologies that enhance data-driven decisions.
- Define New England State DOT processes for airspace authorizations and waivers. There are challenges with navigating the regulatory landscape to ensure compliance with routine and advanced operations, so the research team will develop guidance and recommendations that agencies can use to mitigate these challenges.
- Develop procedures for selected applications of UAS technology. Specific procedures for selected applications will incorporate effective practices and define specifications for integrating UAS technology.
- Issue findings and recommendations. The final report will include a compilation of findings, guidance, and recommendations for specific transportation applications.

Next Steps

Upcoming tasks include identifying current technologies and support systems necessary for specific transportation applications through a targeted market analysis. The research team will then address challenges associated with integrating UAS technologies and complying with federal regulations and rules through case studies at each New England State DOT. These tasks will inform the development of procedures and guidelines to deploying UAS technology. The final report will include specific implementation plans for integrating UAS technology at the New England State DOTs.

Potential Impacts and VTrans Benefits

The outcomes of this research will provide VTrans with implementation plans and specific procedures that improve traditional approaches to transportation operations. Leveraging this investigation into the efficacy of this emerging technology, VTrans will be able to effectively exploit the versatility and value of UAS technology.